

VIII.—This was a slight depression which developed near the Banks of Newfoundland on the 21st; it moved northeastward without exhibiting much storm-energy, and finally dissipated on the 22d.

IX.—This was probably a continuation of low area xiv. of chart i. On the 24th the disturbance was central to the south-eastward of Nova Scotia; it appears to have remained nearly stationary, as on the 25th it was near N. 45°, W. 57°; it was, however, apparently filling up, and on the 26th it was replaced by an area of high-pressure.

X.—This was the most severe storm of the month, and, so far as can be determined from the data as yet to hand, appears to have originated east of the thirtieth meridian. An area of high-pressures occupied the ocean between W. 20° and Newfoundland, and south of 50° north latitude, during the 23d and 24th; on the 25th this began to give way, and the pressure decreased to 29.7 (754.4) and 29.5 (749.3) over the region between W. 30° and the British Isles. The pressure continued to decrease rapidly, and by the 26th all vessels between W. 30° and W. 10°, and N. 48° and 53°, reported barometric readings ranging from 28.43 (722.1) to 29.01 (736.8), with furious westerly gales and very high sea. A report of this gale published in the "Northern Whig" (Belfast newspaper), states that the barometer at 5.30 p. m. of the 26th fell to 27.65 (702.3), which is probably unprecedented. Immense damage was done to shipping on the coasts and to property in the north of Ireland; all telegraph lines were prostrated and many persons were injured. The storm raged throughout the British Isles and western Europe during the 27th, and until the 28th.

XI.—The circulation of the winds between W. 30° and 40° and N. 45° and 50°, on the 28th, showed the development of a depression in that region. By the 29th the pressure ranged from 29.24 (742.7) to 29.4 (746.7) between N. 47°, W. 38, and N. 52°, W. 28°, while strong ssw. and sw. gales prevailed. The disturbance moved northeastward beyond the fifty-fifth parallel on the 30th, the pressure on that day being about 29.3 (744.2), wind wsw., force 8, in N. 55°, W. 11°.

XII.—This disturbance appeared near N. 48°, W. 27° to W. 21°, on the 30th, when the pressure ranged from 29.51 (749.5) to 29.6 (751.8), and at the close of the month it was central southwest of Ireland, attended by strong northerly and north-westerly gales to the westward.

OCEAN ICE.

Chart ii. also exhibits the southern and eastern limits of icebergs in the north Atlantic ocean during the month of January, and up to February 14, 1884. This chart is based on reports communicated by shipmasters to this office; reports furnished through the co-operation of the "New York Herald Weather Service," and other data published by the "New York Maritime Register."

During the period embraced in the reports (January 20th to February 14th), icebergs drifted southward to about N. 42° 50', while the eastern limit was on the forty-fifth meridian. The most dangerous region appears to have been from about N. 45° northward to N. 48°, and between W. 46° and 49°.

A comparison with the chart for the same period in 1883 shows that the southern limit is about 1° 40' south of that for last year, while the eastern limit is about the same for both years. In point of numbers the icebergs appear to be somewhat more numerous than those observed up to February 14, 1883; those reported were seen about ten days earlier than last year.

Icebergs and field-ice have been reported as follows:

January 24th.—S. S. "British Prince," in N. 48° 02', W. 47° 43', passed field-ice.

January 26th.—S. S. "Plover," at Saint John's, Newfoundland, reports heavy Arctic ice northeast of Notre Dame Bay; icebergs of vast size being scattered through the field-ice.

January 28th.—S. S. "Somerset," in N. 47° 25', W. 46° 44', passed a quantity of field-ice.

January 31st.—S. S. "City of Montreal," in N. 46° 25', W.

46° 54', passed great quantities of field-ice; steered sw. for four hours to clear it; s. s. "Britannic," in N. 46° 47', W. 46° 46', passed through several patches of field-ice.

February 1st.—S. S. "Holland," in N. 45° 44', W. —° —', passed a quantity of field-ice fifty miles long, bearing sw. and ne., with several small bergs on the se. side.

2d.—S. S. "Notting Hill" collided with an iceberg and was so seriously damaged that she was abandoned on the 5th in N. 46°, W. 46° 20'; s. s. "England," in N. 45° 28', W. 47° 49', passed through a large quantity of field-ice.

3d.—S. S. "Rhaetia," from N. 44° 57', to N. 44° 53', and W. 49° 38' to W. 49° 50', passed large fields of ice and many pieces; s. s. "Westernland," in N. 45° 26', W. 47° 54', passed through large quantities of field-ice; s. s. "Caspian," in N. 47° 10', W. 48° 00', passed south of some field-ice.

4th.—S. S. "Salerno," in N. 44° 23', W. 48° 38', passed some field-ice; s. s. "Kansas," in N. 46° 14', W. 47° 00', passed four icebergs.

5th.—S. S. "State of Nebraska," in N. 46° 15', W. 46° 20', fell in with some detached ice.

6th.—S. S. "Moravia," in N. 44° 30', W. 48° 45', passed an iceberg; s. s. "Republic," in N. 45° 28', W. 48° 20', passed a quantity of small ice; s. s. "Lord Clive," in N. 43° 50', W. 49° 15', saw an ice-floe apparently about fifty or sixty feet long and ten to fifteen feet high.

7th.—S. S. "Habsburg," in N. 44° 45', W. 49° 0', sighted two small icebergs; s. s. "Leerdam," in N. 46° 56', W. 47° 24', passed some icebergs.

8th.—S. S. "Lydian Monarch," in N. 46° 44', W. 45° 50' passed an iceberg.

9th.—S. S. "Rugia," in N. 44° 04', W. 47° 18', to N. 44° 34', W. 48° 50', passed three icebergs; s. s. "Chateau Lafitte," in N. 42° 50', W. 49° 00', passed an iceberg; s. s. "Canada," in N. 45° 20', W. 49° 24', passed an iceberg; s. s. "Ludgate Hill," in N. 45° 38', W. 47° 25', passed a large iceberg.

10th.—S. S. "Nevada," in N. 46° 22', W. 47° 33', passed several large flat bergs and much field-ice.

13th.—S. S. "Switzerland," in N. 45° 45', W. 45° 29', passed within a mile of a large iceberg about five hundred feet long and one hundred feet high.

14th.—S. S. "Switzerland," in N. 44° 34', W. 49° 28', passed through a quantity of light field-ice.

TEMPERATURE OF THE AIR.

[Expressed in degrees, Fahrenheit.]

In the following table are shown the normal temperatures for January, the mean temperatures for January, 1884, and the departures from the normal in the several geographical districts, as deduced from the records of the Signal Service:

Average temperatures for January, 1884.

Districts.	Average for January. Signal-Service observations.		Comparison of Jan., 1884, with the average for several years.
	For several years.	For 1884.	
New England	26.6	24.3	2.3 below.
Middle Atlantic states.....	33.8	30.7	3.1 below.
South Atlantic states.....	47.2	42.9	4.3 below.
Florida peninsula.....	60.5	57.2	3.3 below.
Eastern Gulf states.....	49.4	44.2	5.2 below.
Western Gulf states.....	47.9	40.9	7.0 below.
Rio Grande valley.....	57.9	52.6	5.3 below.
Tennessee.....	40.0	31.8	8.2 below.
Ohio valley.....	33.0	24.6	8.2 below.
Lower lake region.....	25.1	18.7	6.4 below.
Upper lake region.....	19.6	13.0	6.6 below.
Extreme northwest.....	5.1	0.9	4.2 below.
Upper Mississippi valley.....	23.9	17.9	6.0 below.
Missouri valley.....	19.1	10.0	9.1 below.
Northern slope.....	18.0	18.9	0.9 above.
Middle slope.....	28.5	29.3	0.8 above.
Southern slope.....	45.0	39.0	6.0 below.
Southern plateau.....	42.7	43.3	0.6 above.
Northern plateau.....	31.2	31.2	Normal.
North Pacific coast region.....	39.6	38.9	0.7 below.
Middle Pacific coast region.....	47.1	47.6	0.5 above.
South Pacific coast region.....	52.9	54.5	1.6 above.
Mount Washington, N. H.....	5.4	5.3	0.2 below.
Pike's Peak, Colo.....	2.8	2.4	0.4 below.
Salt Lake City, Utah.....	28.3	29.1	0.8 above.

The general distribution of mean temperature and the districts of maximum departures from the normal for the month of January, from 1873 to 1883, inclusive, are as follows:

Districts.	Maximum departures.	Year.	Distribution.
Michigan and northern Ohio... From Wisconsin and Minnesota to Kansas. Lower Mississippi valley and northwestern New York.	-0.0 -7.0 -12 -5.0 -6	1873...	{ Normal in the south Atlantic states: below the normal in all other districts east of the Rocky mountains.
Ohio valley and Tennessee..... Middle Atlantic states..... Lower lake region..... Upper lake region..... New England.....	+6.9 +6.0 +6.2 +5.5 +3.8	1874...	{ Normal in Minnesota: above the normal in all other districts east of the Rocky mountains, the departures being least in the upper Mississippi and Missouri valleys.
Minnesota..... Upper Mississippi valley..... Upper lake region..... Lower Missouri valley..... Lower lake region.....	-13.1 -11.6 -9.7 -9.5 -9.5	1875...	{ Below the normal in all districts east of the Rocky mountains, the departures being least in the south Atlantic and Gulf states.
Ohio valley and Tennessee..... Upper Mississippi valley..... Missouri valley..... Gulf states..... South Atlantic states..... Pacific coast.....	+9.0 +7.7 +6.9 +6.4 +6.4 +1.2	1876...	{ Below the normal on the Pacific coast: above the normal in all districts east of the Rocky mountains, the smallest departures occurring in Minnesota, the Saint Lawrence valley, and New England.
Pacific coast..... Lower lake region..... Middle Atlantic states..... Saint Lawrence valley..... Upper lake region.....	+3.5 +5.8 +5.4 +4.6 -3.5	1877...	{ Above the normal on the Pacific coast: below the normal in the districts east of the Rocky mountains, the departures in the Ohio valley, south Atlantic and Gulf states being less than 1°.
Minnesota..... Upper Missouri valley..... Upper Mississippi valley..... Lower Missouri valley..... Gulf states..... South Atlantic states.....	+13.3 +12.3 +10.0 +7.8 +1.0 -0.8	1878...	{ Above the normal on the Pacific coast and in all districts eastward, except slightly below at the Rocky mountain stations and in the south Atlantic and Gulf states.
Lower Missouri valley..... Rio Grande valley..... Canadian maritime stations..... Middle Atlantic states..... Lower lake region..... Florida peninsula.....	+1.9 +1.6 +1.0 -2.8 -2.6 -2.4	1879...	{ Normal in the south Atlantic states, upper lake region, Minnesota, upper Mississippi valley, northern and southern slopes, at Salt Lake City, Utah, and Tucson, Arizona: above the normal in the lower Missouri and Rio Grande valleys and at the Canadian maritime stations; below the normal in all other districts.
Upper Mississippi valley..... Ohio valley and Tennessee..... South Atlantic states..... Western Gulf states..... Sacramento..... San Francisco.....	+15.5 +14.8 +13.3 +13.3 -7.2 -4.3	1880...	{ Below the normal in California, and at Olympia, Washington Territory: decidedly above the normal in the northern plateau and in all districts east of the Rocky mountains.
Middle Pacific coast..... Salt Lake City, Utah..... Missouri valley..... Southern slope..... Upper Mississippi valley..... Western Gulf states.....	+3.5 +3.5 +9.8 +8.9 +8.2 -7.6	1881...	{ Above the normal in the north and middle Pacific coast regions, and at Salt Lake City, Utah; below the normal in all other parts of the country, the departures being less than 1° in Florida and in the northern plateau.
Missouri valley..... Western Gulf states..... Florida peninsula..... Middle plateau..... Northern plateau..... South Pacific coast.....	+5.6 +5.1 +4.9 +4.6 +3.2 +3.2	1882...	{ Below the normal on the Pacific coast and in the plateau districts: above the normal in all districts east of the Rocky mountains, except 0.2 below in New England.
Florida peninsula..... South Pacific coast..... Extreme northwest..... Upper Mississippi valley..... Missouri valley..... Upper lake region.....	+2.4 +0.7 -11.5 -11.3 -9.0 -7.9	1883...	{ Above the normal in Florida and in southern California; below the normal in all other districts, the departures being less than 1° in the south Atlantic and eastern Gulf states and southern plateau.

The distribution of mean temperature over the United States and Canada for January, 1884, is exhibited on chart iii. by the dotted isothermal lines.

The month of January, 1884, was slightly warmer than the average in California, in the northern and middle slopes, and in the middle and southern plateau districts. A comparison of the mean temperatures for January in those districts with the normal shows departures of from 0°.5 to 0°.9, except in southern California, where it amounted to 1°.6. The mean temperature for the northern plateau does not differ from the normal for that district. In the north Pacific coast region, and in all districts east of the Rocky mountains, excepting the northern and middle slopes, the mean temperature of the month has been below the average. A marked deficiency of 8°.2 occurred in the Ohio valley, Tennessee, and the eastern Gulf states. In the lake region, upper Mississippi valley, west

Gulf states, and southern slope, the deficiencies ranged from 6° to 7°. In the other districts east of the Rocky mountains where deficiencies occurred, they varied from 2°.3 in New England to 5°.3 in the Rio Grande valley.

DEVIATIONS FROM MEAN TEMPERATURE.

The departures exhibited by the reports from the regular Signal Service stations are shown in the table of average temperatures for January, 1884. The following notes in connection with this subject are reported by voluntary observers.

Alabama.—Green Springs, Hale county: mean temperature, 37°.6, is 9° below the mean of January, 1883, and is the lowest monthly mean that has occurred during the last ten years.

Arkansas.—Lead Hill, Boone county: mean temperature, 28°.5, is 8°.1 below the January average of the last two years.

Georgia.—Forsyth, Monroe county: mean temperature, 40°.8, is, with the exception of 39°.8 for December, 1876, the lowest monthly mean temperature that has occurred during the last ten years.

Illinois.—Anna, Union county: mean temperature, 25°.6, is 7°.2 below the January average of nine years. The temperature extremes, the monthly means, and the highest and lowest daily means for two of the coldest months of which there is a record, are:

January, 1864.	January, 1884.
Highest temperature..... 67	Highest temperature..... 65
Lowest temperature..... -22	Lowest temperature..... -27
Monthly mean temperature..... 32.2	Monthly mean temperature..... 25.6
Highest daily mean temperature..... 58.5	Highest daily mean temperature..... 60.0
Lowest daily mean temperature..... -11.7	Lowest daily mean temperature..... -15.0

Riley, McHenry county: mean temperature, 9°.8, is 8° below the January average of the last twenty-one years, and is, with the exception of that for January, 1875, the lowest for the period named.

Mattoon, Coles county: mean temperature, 21°, is 5° below the January average of the last five years.

Indiana.—Wabash, Wabash county: mean temperature, 18°.7, is 6°.7 below the January average of eight years.

Logansport, Cass county: mean temperature, 18°.6, is 11°.3 below the January average of the last twenty-five years.

Laconia, Harrison county: mean temperature, 23°.0, is the lowest January mean of which there is a record.

Kansas.—Independence, Montgomery county: mean temperature, 22°.0, is 7°.2 below the January average of thirteen years.

Lawrence, Douglas county: mean temperature, 20°.99, is 5°.65 below the January average of the last seventeen years.

Wellington, Sumner county: mean temperature, 23°.9, is 3°.4 below the January average of the four preceding years.

Yates Centre, Woodson county: mean temperature, 19°.5, is 6°.1 below the average of the four preceding years.

Kentucky.—Bowling Green, Warren county: mean temperature, 26°.4, is the lowest monthly mean ever recorded.

Maryland.—Fallston, Harford county: mean temperature, 26°.1, is 4°.2 below the average of the last thirteen years.

Massachusetts.—Westborough, Worcester county: mean temperature, 22°.4, is 2°.5 below the average of the last five years.

Mr. J. B. Hall, of Worcester, Massachusetts, reports the normal mean temperature of January for a period of forty-five years to be 29°.6 (†), and the mean for January to be 20°.4, or 9°.2 (†) below the normal. During the period above named the lowest January mean temperature, 16°.7, occurred in 1856; and the highest, 34°.9, occurred in 1880.

Missouri.—Saint Louis: Professor Nipher, director of the "Missouri Weather Service," reports as follows:

January has been unusually cold * * * The average temperature at the central station was 22°.3, which is 9°.1 below the normal January temperature for Saint Louis, as shown by Dr. Engelmann's series for forty-nine years. The average January temperature was, however, lower than the mean for January, 1884, in the following years, viz: 20°.2 in 1856, 19°.3 in 1857; and 21°.3 in 1875.

New Hampshire.—Contoocookville, Merrimac county: mean

temperature, 19°.1 is 2° below the January average of a period of twelve years.

New Jersey.—South Orange, Essex county: mean temperature, 23°.8, is the lowest January mean of the last fourteen years.

New York.—Palermo, Oswego county: mean temperature, 14°.1, is 7°.5 below the January average of the last thirty-one years. The highest January mean of that period, 29°.4, occurred in 1880; the lowest, 12°.8, occurred in 1881.

North Volney, Oswego county: mean temperature, 16°.8, is 5°.2 below the January average of sixteen years.

North Carolina.—Highlands, Macon county: January, 1884, was a remarkably cold month; mean temperature, 26°.8.

Ohio.—Wauseon, Fulton county: mean temperature, 14°.5, is 9°.5 below the January average of the last fourteen years. The highest January mean of that period, 37°.7, occurred in 1880; the lowest, 12°.2, in 1875. The temperature extremes

are: maximum, 69°.5, in 1876; minimum, -31°.7, January 25, 1884.

Texas.—New Ulm, Austin county: mean temperature, 44°.04, is 6°.83 below the January mean of the last twelve years. The highest January mean of that period, 63°.7, occurred in 1879; the lowest, 43°.17, in 1880. The temperature extremes are: maximum, 84°, in 1880; minimum, 10°, in 1873.

Vermont.—Woodstock, Windsor county: mean temperature, 11°.15, is 3°.72 below the January average of the last seventeen years. The highest January mean of that period, 23°.77, occurred in 1880; the lowest, 5°.82, in 1875. The temperature extremes are: maximum, 62°, in 1876; minimum, -38°, in 1873 and 1878.

Virginia.—Variety Mills, Nelson county: mean temperature, 30°.5, is 5° below the January average of the last seven years, and is the lowest for that period. The minimum temperature of the 7th, -8°.5, is the lowest recorded since 1881.

Table of comparative minimum temperatures for the month of January.

State or Territory.	Minimum for January, 1884, Signal Service.		Minimum since Signal-Service stations were opened—3 to 13 years.			Lowest from any other source.			
	Station.	Temp.	Station.	Temp.	Year.	Place.	Temp.	Year.	Length of Record.
Alabama	Montgomery	0	Montgomery	0	73, '79	Huntsville	-9	1832, '36	9 years.
Arizona	Fort Bowie	1	Prescott	-17	1880	Fort Canby (old)	-20	1856	12 "
Arkansas	Fort Smith	-5	Fort Smith	2	1883	Mount Ida	-10	1878	6 "
California	Red Bluff	-30	Campo	0	1880	Fort Crook	-20	1859	11 "
Colorado	Pike's Peak	-33	Pike's Peak	-37	1883	Fort Garland	-40	1873	30 "
Do	West Las Animas	-10	Denver	-29	1875	Fort Lyon	-28	1875	22 "
Connecticut	New Haven	4	New Haven	-14	1873	Colebrook	-25	1861	9 "
Do	New London	6	New London	-14	1873	New Haven	-24	1835	87 "
Dakota	Fort Yates	-45.5	Pembina	-53	1877	Fort Randall	-44	1875	22 "
Do	Fort Buford	-41	Fort Buford	-46	1883	Fort Stevenson	-55	1881	9 "
Delaware	Delaware Breakwater	9	Delaware Breakwater	10	1882	Fort Delaware	-5	1866	44 "
District of Columbia	Washington City	1.7	Washington City	-14	1881	Washington City	-14	1835	48 "
Florida	Pensacola	16	Saint Marks	18	1879	Fort Barrancas	10	1852	61 "
Georgia	Atlanta	-1.3	Atlanta	9	1879	Atlanta	3	1873	4 "
Do	Augusta	14	Augusta	15	1873	Augusta Arsenal	8	1835	48 "
Idaho	Coeur d'Alene	-2	Fort Lapwai	-38	1882	Fort Lapwai	-32	1875	19 "
Illinois	Chicago	-18.5	Chicago	-18	1879	Rock Island Arsenal	-29	1873	14 "
Do	Springfield	-22	Champaign	-15	1881	Galesburg	-29	1864	8 "
Indiana	Indianapolis	-25	Indianapolis	-22	1879	Arlington, near	-25	1879	2 "
Indian Territory	Cantonment	-5	Fort Supply	-17	1881	Fort Gibson	-20	1857	54 "
Do			Fort Gibson	-12	1881	Fort Sill	-20	1873	9 "
Iowa	Des Moines	-30	Dubuque	-26	1883	Fort Madison, near	-33	1864	18 "
Kansas	Leavenworth	-21	Leavenworth	-29	1873	Fort Leavenworth	-30	1834	52 "
Kentucky	Louisville	-19	Louisville	-10	74, '79	Newport Barracks	-15		29 "
Louisiana	Shreveport	10	Shreveport	6	1879	Baton Rouge	8	1852	2 "
Do	New Orleans	22	New Orleans	20	1879	Okalooska	5	1879	3 "
Maine	Eastport	8	Eastport	-20	1874	Brunswick	-32	1859	52 "
Do	Portland	2	Portland	-11.5	1882	Gardiner	-32	1878	41 "
Maryland	Baltimore	8	Baltimore	-6	1881	Fort McHenry	-15	1873	53 "
Massachusetts	Boston	-0.5	Springfield	-14	1881	Williamstown	-30	1835	55 "
Michigan	Marquette	-19	Escanaba	-28	1873	Fort Brady	-42	1873	60 "
Do	Alpena	-20	Alpena	-27	1882	Ontonagon	-34	1861	17 "
Minnesota	Saint Vincent	-41	Saint Vincent	-44	81, '82	Fort Ripley	-44	1860	17 "
Do	Moorhead	-43	Moorhead	-43	1882	Minneapolis	-40	1868	6 "
Mississippi	Vicksburg	10	Vicksburg	10	1875	Fayette	7	1879	9 "
Missouri	Saint Louis	-21.5	Saint Louis	-16	1875	Ashley	-27	1879	4 "
Do						Saint Louis	-19	1835	40 "
Montana	Fort Benton	-24	Fort Benton	-55	1875	Fort Benton	-58	1875	13 "
Do	Poplar River	-48	Virginia City	-44	1875	Fort Ellis	-53	1872	15 "
Nebraska	North Platte	-9	North Platte	-27	1881	Camp Sheridan	-30	1881	5 "
Do	Omaha	-38	Omaha	-22	1879	Fort Niobrara	-35	1881	1 "
Nevada			Pioche	-17	1882	Fort Ruby	-23	1864	5 "
Do			Winnemucca	-14	1879	Fort Halleck	-22	1868	13 "
New Hampshire	Mount Washington	-29	Mount Washington	-46	1875	Dartmouth College	-34	1848	17 "
New Jersey	Barnegat City	8	Barnegat City	-10	1875	Paterson	-13	1866	10 "
Do	Atlantic City	8	Squad Beach	-10	1875	Atco	-24	1881	7 "
Do	Sandy Hook	4	Sandy Hook	-3	1879	Burnt Mills	-24	1875	3 "
New Mexico	Fort Stanton	-2	Santa Fé	-13	1882	Fort Union	-25	1881	31 "
New York	Albany	-4	Albany	-18	1878	Salem	-40	1840	8 "
Do	Buffalo	-13.5	Oswego	-13	1883	Gouverneur	-38	1835	40 "
North Carolina	Charlotte	5	Charlotte	11	79, '81	Murphy	-16	1877	8 "
Do	New River Inlet	4	Kitty Hawk	11	1879	Lenoir	-16	1877	7 "
Ohio	Columbus	-20	Columbus	-20	1879	Westerville	-24	1877	8 "
Do	Toledo	-14	Sandusky	-16.5	1879	Jacksonburg	-25	1879	8 "
Oregon	Fort Klamath	9	Umatilla	-25	1879	Fort Dalles	-23	1864	16 "
Pennsylvania	Pittsburg	-6	Pittsburg	-12	1875	Carlisle Barracks	-28	1873	37 "
Do	Erie	-10	Philadelphia	-5	1875	Philadelphia	-9	1866	111 "
Rhode Island	Point Judith	3	Newport	-8	1882	Providence	-17	1866	35 "
Do	Narragansett Pier	2	New Shoreham	-4	1882	Fort Adams	-13	1873	41 "
South Carolina	Charleston	13	Charleston	19	1873	Spartanburg	0	1877	3 "
Do						Charleston	16	1852	105 "
Tennessee	Knoxville	-16	Knoxville	-14	1877	Clarksville	-10	1879	8 "
Do	Nashville	-10	Nashville	-8	1877	Glenwood Cottage	-8	1864	10 "
Texas	Fort Elliott	0.7	Fort Elliott	-12	1883	Fort Davis	-15	1873	28 "
Utah	Salt Lake City	2	Salt Lake City	0	74, '82	Coalville	-30	75, '77	8 "
Vermont			Burlington	-25	1882	Woodstock	-38	1878	8 "
Virginia	Lynchburg	2	Fort Myer	-8	1881	Mount Solon	-18	1881	7 "
Washington Territory	Dayton	-1.5	Spokane Falls	-28	1883	Fort Colville	-33	1875	20 "
West Virginia			Morgantown	-6	1875	Helvetia	-14	1879	7 "
Wisconsin	La Crosse	-29	La Crosse	-43	1873	Embarass	-40	1875	19 "
Wyoming	Cheyenne	-11	Cheyenne	-38	1875	Fort Laramie	-40	1864	29 "
Do						Fort Sanders	-61	1875	13 "

Table of maximum and minimum temperatures for January, 1884.

State or Territory.	Signal Service.			U. S. Army Post Surgeons, or Voluntary Observers.		
	Station.	Max.	Min.	Station.	Max.	Min.
Alabama	Montgomery	70	0	Auburn	67	0
Do	Mobile	67	14	Mt. Vernon Bar'ks.	74	10
Arizona	Willcox	80	2	Pantano	85	34
Do	Fort Bowie	68	1	Willcox	72	10
Arkansas	Little Rock	72	0	Fayetteville	67	-19
Do	Fort Smith	69	-5	Mount Ida	72	-2
California	Los Angeles	78	34	Mojave	86	20
Do	Red Bluff	67	30	Summit	36	16
Colorado	West Las Animas	68	-10	Gunnison	31	-30
Do	Pike's Peak	22	-33	Fort Lyon	66	-7
Connecticut	New London	52	6	Voluntown	50	4
Do	New Haven	50	4	Southington	49	-9
Dakota	Deadwood	59	-14.5	Fort Lincoln	40	-45
Do	Fort Yates	45	-45.5	Fort Sully	52	-30
Delaware	Del. Breakwater	53	9	Rock Creek Bridge	49	6
District of Columbia	Washington City	52	-1.7	Lincoln	82	28
Florida	Sanford	82	28	Fort Barrancas	74	10
Do	Pensacola	71	16	Forsyth	72	6
Georgia	Augusta	68	14	Andersonville	70	12
Do	Atlanta	64	-1.5	Fort Lapwai	47	4
Idaho	Lewiston	54	11	Anna	65	-21
Do	Coeur d'Alene	50	-2	Riley	40	-31
Illinois	Cairo	66	-16	Marengo	62	-16
Do	Springfield	62	-22	Lafayette	55	-28
Indiana	Indianapolis	57	-25	Fort Reno	69	-4
Do	Cantonment	-5	-5	Guttenberg	42	-38
Indian Territory	Keokuk	52	-24	Des Moines	50	-31
Iowa	Des Moines	49	-30	West Leavenworth	55	-26
Do	Leavenworth	57	-21	Fort Scott	64	-24
Kansas	Dodge City	66	-11	Frankfort	58	-20
Do	Louisville	62	-19.5	Bowling Green	63	-8
Kentucky	Shreveport	75	10	Luling	78	18
Do	New Orleans	72	22	Liberty Hill	71	13
Louisiana	Portland	48	-3	Fort Preble	45	-3
Maine	Eastport	45	-8	Orono	43	-29
Do	Baltimore	52	8	Cumberland	54	-2
Maryland	Ocean City	52	4	Woodstock	48	-2
Do	Boston	52	-0.5	Taunton	51	-3
Massachusetts	Thatcher's Island	48	3	Rowe	46	-15
Do	Detroit	52	0	Fort Brady	36	-32
Michigan	Alpena	40	-20	Ann Arbor	51	-17
Do	Saint Paul	45	-32	Chester	39	-33
Minnesota	Moorhead	42	-43	Fort Snelling	43	-33
Do	Vicksburg	73	10	Saint Louis	69	-23
Mississippi	Saint Louis	67	-21.5	Sedalia	56	-33
Missouri	Fort Shaw	51	-15	Fort Shaw	51	-15
Do	Poplar River	45	-48	Fort Keogh	45	-32
Montana	North Platte	49	-9	Stella	55	-26
Do	Omaha	47	-32	Nebraska City	50	-30
Nebraska	Wadsworth	58	8	Halleck	40	-35
Do	Mount Washington	36	-29	Contoocookville	48	-12
New Hampshire	Barnegat City	52	7	Vineyard	50	-8
Do	Atlantic City	50	4	Newark	54	-9
New Jersey	Fort Craig	62	8	Fort Union	65	-13
New Mexico	Fort Stanton	65	2	Fort Wingate	51	7
Do	Albany	50	-4	Fort Hamilton	50	-2
New York	Oswego	47	-10.5	Madison Barracks	41	-29
Do	Hatteras	68	15	Highlands	50	-3
North Carolina	New River Inlet	66	4	Raleigh	63	-2
Do	Cincinnati	60	-10	Portsmouth	58	10
Ohio	Columbus	48	-20	Wauseon	50	-32
Do	Roseburg	63	25	Albany	59	-24
Oregon	Fort Klamath	51	9	Fort Klamath	45	-5
Do	Philadelphia	55	10	Leedsdale	52	-12
Pennsylvania	Erie	48	10	Wellsborough	42	-24
Do	Block Island	54	8	Aiken	69	8
Rhode Island	Narragansett Pier	48	2	Darnall	74	-14
Do	Charleston	70	13	Beech Grove	61	-14
South Carolina	Memphis	71	-2	New Ulm	78	12
Tennessee	Knoxville	59	-16	Cleburne	72	1
Do	Rio Grande City	85	21	Ogden	52	-6
Texas	Fort Elliott	73	1	Logan	48	-13
Do	Salt Lake City	52	2	Newport	48	-29
Utah				Woodstock	45	-30
Vermont				Fort Monroe	63	-3
Do	Cape Henry	68	12	Variety Mills	50	-8.5
Virginia	Lynchburg	52	2	Fort Townsend	57	-25
Washington Territory	Neah Bay	59	35	Fort Spokane	51	-5
Do	Dayton	57	-1.5	Helvetia	58	-7
West Virginia				Embarras	46	-35
Wisconsin	La Crosse	45	-29	Nellisville	36	-30
Do	Milwaukee	45	-24	Fort Bridger	44	-15
Wyoming	Cheyenne	50	-11			

Wytheville, Wythe county: mean temperature, 29°.2, is 6° below the January average of a period of nineteen years, and is the lowest for that period.

Wisconsin.—Manitowoc, Manitowoc county: mean temperature, 13°.2, is 2°.5 below the January average of the last thirty-two years. The highest January mean of that period, 33°.0, occurred in 1880; the lowest, 8°.4, in 1875.

Beloit, Rock county: mean temperature, 10°.2, is the lowest

monthly mean that has occurred since 1850, with the exception of January, 1856, '57, '75, '81, and '83.

Sussex, Waukesha county: mean temperature, 10°.2, is much below the January average.

MONTHLY RANGES OF TEMPERATURE.

The monthly ranges of temperature were greatest in the extreme northwest and over the lower Ohio and central Mississippi valleys. In the extreme northwest they varied from 77° to 93°, and in the Ohio and central Mississippi valleys from 82° to 88°. The monthly ranges were least on the Pacific coast.

Stations reporting monthly ranges of 75° or more, are as follows: Poplar river, Montana, 93°; Fort Yates, Dakota, 90°; Saint Louis, Missouri, 88°; Fort Buford, Dakota, 87°; Springfield, Illinois, 85°; Moorhead, Minnesota, 85°; Bismarck and Huron, Dakota, 82°; Cairo, Illinois, 82°; Indianapolis, Indiana, 82°; Louisville, Kentucky, 82°; Fort Bennett, Dakota, 80°; West Las Animas, Colorado, 79°; Omaha, Nebraska, 79°; Des Moines, Iowa, 79°; Yankton, Dakota, 78°; Dodge City, Kansas, 78°; Leavenworth, Kansas, 78°; Saint Vincent, Minnesota, 77°; Keokuk, Iowa, 77°; Duluth and Saint Paul, Minnesota, 76°; Nashville, Tennessee, 76°; Knoxville, Tennessee, 75°.

Monthly ranges of 40° or less were reported by the following stations: Linkville, Oregon, 40°; San Diego, California, 39°; Provincetown, Massachusetts, 39°; New York City, 39°; Roseburg, Oregon, 38°; Red Bluff, California, 37°; Yuma, Arizona, 35°; Portland, Oregon, 34°; Sacramento, California, 30°; Key West, Florida, 30°; Cape Mendocino, California, 25°; Neah Bay, Washington Territory, 24°; Fort Canby, Washington Territory, 23°; Port Angeles, Washington Territory, 19°; San Francisco, California, 16°.

GREATEST DAILY RANGES OF TEMPERATURE.

The greatest daily ranges of temperature varied in the several districts as follows:

New England.—From 22° at Provincetown, Massachusetts, on the 8th, 13th, and 22d, to 32° at New Haven and New London, Connecticut, on the 8th.

Middle Atlantic states.—From 23° at New York City, on the 8th, Sandy Hook, New Jersey, on the 9th, and at Delaware Breakwater, Delaware, on the 22d, to 36° at Washington City, District of Columbia, on the 8th.

South Atlantic states.—From 24° at Savannah, Georgia, on the 10th, to 38° at Fort Macon, North Carolina, on the 5th.

Florida peninsula.—From 15° at Key West, on the 23d, to 29° at Sanford, on the 7th.

Eastern Gulf states.—From 27° at New Orleans, Louisiana, on the 7th, to 35° at Montgomery, Alabama, on the 5th.

Western Gulf states.—From 30° at Indianola, Texas, and Shreveport, Louisiana, on the 5th and 9th, respectively, to 39° at Fort Smith, Arkansas, on the 9th.

Rio Grande valley.—From 36° at Brownsville, Texas, on the 6th, to 44° at Rio Grande City, Texas, on the 3d.

Tennessee.—From 27° at Memphis, on the 9th, to 35° at Nashville, on the 12th.

Ohio valley.—From 24° at Indianapolis, Indiana, on the 22d, to 29° at Columbus, Ohio, on the 26th.

Lower lake region.—From 26° at Buffalo, New York, on the 13th, and at Sandusky, Ohio, and Detroit, Michigan, on the 23d, to 30° at Cleveland, Ohio, and Oswego, New York, on the 13th and 14th, respectively.

Upper lake region.—From 25° at Chicago, Illinois, on the 21st, to 56° at Marquette, Michigan, on the 17th.

Extreme northwest.—From 41° at Fort Buford, Dakota, on the 13th, to 51° at Saint Vincent, Minnesota, on the 17th.

Upper Mississippi valley.—From 29° at Cairo, Illinois, on the 4th, to 42° at Des Moines, Iowa, on the 23d.

Northern slope.—From 38° at Helena, Montana, on the 30th, to 48° at Fort Shaw, Montana, on the 7th.

Middle slope.—From 27° on the summit of Pike's Peak, Colorado, on the 2d, to 48° at West Las Animas, Colorado, on the 8th and 12th.

Southern slope.—From 44° at Fort Concho, Texas, on the 8th, to 52° at Fort Stockton, Texas, on the 6th.

Southern plateau.—From 27° at Fort Grant, Arizona, on the 12th, to 46° at El Paso, Texas, on the 9th.

Middle plateau.—24° at Salt Lake City, Utah, on the 25th.

Northern plateau.—From 20° at Lewiston, Idaho, on the 31st, to 25° at Spokane Falls and Dayton, Washington Territory, on the 21st and 31st, respectively.

North Pacific coast region.—From 15° at Fort Canby, Washington Territory on the 15th, to 19° at Portland and Roseburg, Oregon, on the 11th and 12th, respectively.

Middle Pacific coast region.—From 13° at San Francisco, California, on the 14th, to 29° at Sacramento, California, on the 22d.

South Pacific coast region.—From 31° at San Diego, California, on the 23d, to 37° at Los Angeles, California, on the 12th.

The following are some of the highest and lowest monthly mean temperatures reported from the Signal Service stations:

Stations reporting highest.	Stations reporting lowest.
Key West, Florida..... 68.3	Saint Vincent, Minnesota..... -7.9
Sanford, Florida..... 55.6	Moorhead, Minnesota..... -3.5
San Diego, California..... 55.0	Pike's Peak, Colorado..... 2.4
Yuma, Arizona..... 54.6	Fort Yates, Dakota..... 4.1
Los Angeles, California..... 53.9	Bismarck, Dakota..... 4.2
Brownsville, Texas..... 53.1	Mount Washington, New Hampshire..... 5.2
Rio Grande City, Texas..... 52.1	Duluth, Minnesota..... 5.3
Cedar Keys, Florida..... 51.6	Fort Buford, Dakota..... 6.3
Phoenix, Arizona..... 50.6	Saint Paul, Minnesota..... 7.9
Fort McDowell, Arizona..... 50.4	Escanaba, Michigan..... 8.6
New Orleans, Louisiana..... 47.1	Huron, Dakota..... 8.9
Galveston, Texas..... 46.7	Marquette, Michigan..... 10.9
Indianola, Texas..... 46.7	Fort Bennett, Dakota..... 12.1

LOW TEMPERATURES.

The minimum temperatures produced by high area number iii. in Montana, Dakota, and Minnesota on the 4th, and during the 5th and 6th over the central valleys and Southern states, were, generally, the lowest recorded since the establishment of the Signal Service stations. Over northeastern Montana and the northern parts of Dakota and Minnesota the minimum temperatures were -40° and below, on the morning of the 4th. Very low temperatures also occurred on the 24th, 25th, and 26th, during the passage of high area number vii., in the lake region, where, at the most northerly stations, they were lower than those which occurred in connection with the high area previously mentioned.

The following reports of remarkably low temperatures have been received from the several states and territories.

Alabama.—Montgomery: very cold weather prevailed on the 5th and 6th. On the latter date the thermometer recorded a minimum temperature of 8°, which is the lowest that has occurred since December 30, 1880, when the same temperature was recorded. These are the lowest temperatures of the last ten years.

Mobile: the minimum temperature of the 6th, 14°, is the lowest recorded since the opening of the signal office, in 1871. A minimum temperature of 14° was recorded on December 30, 1880.

Green Springs, Hale county: the temperature at 2 a. m. of the 6th was -4°, and at 7 a. m., it was 4°. These are the lowest temperatures recorded for several years.

Arkansas.—Little Rock: very cold weather on the 5th and 6th; on the morning of the 6th a minimum temperature of 5° was recorded at the signal office; several instruments in different parts of the city indicated a temperature of -3°.

Lead Hill, Boone county: much suffering was caused by the extremely cold weather of the 5th. The minimum temperature of that date was -15°.

Dakota.—Huron: on the 3d the maximum temperature was -4°; minimum, -22° 5. On the 4th the temperature fell to -38°, which is said to be the lowest ever recorded. On that date the temperature did not rise above -26°. A minimum temperature of -38° was also recorded on the 5th.

Bismarck: the 4th was the coldest day experienced for many

years; mean temperature for the day, -34° 3; minimum, -40°.

Vermillion, Clay county: the night of the 4-5th was extremely cold; the temperature fell to -34° 5.

Florida.—Jacksonville: freezing weather prevailed on the 6th; the temperature fell to 21°.

Pensacola: the weather was remarkably cold on the 6th; the minimum temperature during the morning was 16° 3, which is the lowest on the records of the signal office.

Georgia.—Atlanta: the temperature fell to -1° 3 on the morning of the 6th, which is the lowest on the records of the signal office. Much suffering resulted from the cold weather.

Augusta: the lowest temperature of the season, 14°, occurred on the morning of the 6th.

Forsyth, Monroe county: the daily mean temperatures of the 5th and 6th were 21° 5 and 22° 5, respectively. These are probably the lowest daily means that have occurred since 1835, with the exception of December 29 and 30, 1880. The effect of this cold weather was very damaging to agricultural interests. The mild season previous to January 1st was most favorable to vegetation. A large acreage of oats was seeded and the crop was in excellent condition, but from present appearances the crop has been almost entirely destroyed.

Illinois.—Olney, Richland county: on the morning of the 5th thermometers registered temperatures of -28° and -30°, which are the lowest temperatures ever experienced.

Cairo: the minimum temperature on the 5th, -16°, is the lowest on the records of the signal office. The mean temperature for the day was -9° 1.

Springfield: the 5th was the coldest day experienced for several years; the average temperature for the day was -16° 1; maximum, -11° 5, and minimum, -22° 5.

Rockford, Winnebago county: the temperature on the 4th, -40°, is the lowest known for forty years.

Chicago: minimum temperature on the 5th, -18° 5, has been exceeded only once since 1871, viz: -20° in 1875.

Marshall, Clark county: the night of the 4-5th was the coldest ever known; at 2 a. m. the thermometer read -30°.

Peoria, Peoria county: the temperature on the morning of the 5th fell to -27°, which is the lowest recorded during the last twenty-nine years.

Edgington, Rock Island county: the weather on the 3d, 4th and 5th was the coldest experienced since 1856. The thermometer indicated -34° on the morning of the 5th. Many persons were frost-bitten.

Riley, McHenry county: the minimum temperature, -30° 5, on the morning of the 5th, was the lowest that has occurred during the last twenty-one years. The mean for that date, -23°, is, with the exception of that for January 1, 1864, the lowest daily mean recorded during the last twenty-one years.

Collinsville, Madison county: the minimum temperature of the 5th, -23°, was the lowest recorded since January 1, 1864.

Indiana.—New Albany, Floyd county: the 5th was the coldest day that has been experienced for thirty-five years. At 6 a. m. the temperature was -23°, at noon, -10°, and at 7 p. m., -12°.

Vincennes, Knox county: the temperature during the early morning of the 5th was -30°, and at sunrise, -28°; it remained below zero all day, and at night fell to -20°.

Rising Sun, Ohio county: during the morning of the 5th the temperature was -22°, and at noon, -4°.

Shelbyville, Shelby county: the minimum temperature of the 5th was -26°, and the maximum, -6°. The following are the lowest temperatures recorded since 1842, as shown by the meteorological record of Dr. Milton Robins:

Year.	Month.	Minimum temperature.	Year.	Month.	Minimum temperature.
1851.....	December 17.....	-20	1856.....	February 4.....	-30
1852.....	January 19.....	-26	1873.....	January 29.....	-27
1852.....	January 20.....	-28	1877.....	January 9.....	-26

Indianapolis: on the 5th the temperature remained below zero all day. The minimum temperature of that date, -25° , is the lowest that has been recorded since the establishment of the signal office, in 1871. The temperature did not rise above zero on the 6th, the minimum being -20° .

Logansport, Cass county: the minimum temperature, -24° , on the 5th, is, with the exception of -30° in 1873, the lowest recorded during the last twenty-five years.

Vevay, Switzerland county: Professor Boerner reports that the minimum temperature (-23°) on the morning of the 5th is the lowest ever recorded. Observers in surrounding localities reported temperatures ranging from -21° to -27° .

Sunman, Ripley county: on the morning of the 5th the thermometer indicated a temperature of -24° , which is the lowest recorded for the last thirty years.

Iowa.—**Sioux City, Woodbury county:** the temperature at 1 p. m. of the 4th was -21° .

Council Bluffs, Pottawattomie county: at 10 p. m. of the 4th the thermometer read -24° , which is the lowest observed for twenty-five years.

Dubuque: intensely cold weather prevailed on the 3d, 4th, and 5th. On the last date the temperature fell to -24° , and the mean for the day was $-14^{\circ}.2$.

Burlington: during the early morning of the 5th the temperature fell to -33° .

Des Moines: on the a. m. of the 5th the temperature fell to $-30^{\circ}.4$, which is the lowest recorded here for many years. It did not rise above -7° during the 4th, and remained below zero throughout the 5th, the daily means for the 4th and 5th being $-18^{\circ}.0$ and $-13^{\circ}.7$, respectively.

Fort Madison, Lee county: the weather on the 5th was the coldest ever experienced. On that morning the thermometer read -30° . Records covering a period from 1848 to 1884 show that the temperature had never before fallen below -25° .

Humboldt, Humboldt county: at 2 p. m. of the 4th the thermometer indicated -27° and on the morning of the 5th it read -33° , which are the lowest temperatures ever recorded.

Kansas.—**Independence, Montgomery county:** the thermometer read -20° on the a. m. of the 5th, which is the lowest ever recorded.

Fort Scott, Bourbon county: on the morning of the 5th a temperature of -24° was recorded, which is the lowest ever known. A car load of mules were frozen to death a few miles east.

Leavenworth: the temperature on the 5th ranged from -4° to -21° .

Kentucky.—**Louisville:** at the morning observation of the 5th the minimum thermometer indicated a temperature of -18° , while the exposed standard read -15° ; a little later the minimum thermometer recorded $-19^{\circ}.5$. At 3 p. m. the temperature had risen to -3° , and fell again to -14° during the evening. The daily means for the 5th and 6th were $-9^{\circ}.3$ and $-1^{\circ}.2$, respectively. This is the coldest weather ever experienced. The lowest temperature previously recorded since the establishment of the signal office in 1871 is -10° , for Januarys of 1875 and 1879.

Cynthiana, Harrison county: at 5 a. m. of the 5th the thermometer read -22° .

Maine.—**Bangor:** authentic reports from Aroostook county state that on the morning of the 28th the temperature fell to -40° , which is the lowest ever recorded.

Michigan.—**Alpena:** the temperature remained below zero all day on the 5th; at 10.34 p. m. it was -16° , and at midnight, -30° . During the 24th the temperature did not rise above $-3^{\circ}.5$.

Mackinaw City: on the 24th the thermometer did not rise above $-3^{\circ}.5$, and the minimum was $-15^{\circ}.9$. This was the coldest weather experienced since the opening of this station.

Port Huron: the minimum temperature on the morning of the 25th, $-11^{\circ}.3$, is the lowest of the season.

Grand Haven: the steamer "Wisconsin," which left port at 7 p. m. of the 2d for Milwaukee, arrived at that place at noon

of the 4th. Captain McGregor states that great suffering was experienced by the crew from the extremely cold weather, the thermometer registering from -14° to -17° . The lowest temperature ($-8^{\circ}.5$) of the season at Grand Haven was recorded on the 24th. Thermometers exposed near the ground in various parts of the city indicated a temperature of -14° .

Cheboygan, Cheboygan county: the thermometer indicated -30° at 2 a. m. of the 25th, which is the lowest observed for many years.

Grand Rapids, Kent county: thermometers in this vicinity registered from -20° to -30° on the morning of the 24th. The night of the 23d-24th was one of the coldest in this region since February 9, 1875, when the temperature fell to -38° .

Minnesota.—**Minneapolis:** the thermometer at noon of the 4th read -30° . The temperature on this date was the lowest experienced for twenty-five years.

Mississippi.—**Vicksburg:** the minimum temperature on the morning of the 6th, $10^{\circ}.3$, is, with the exception of 10° on January 6, 1875, the lowest on the records of the signal office.

Missouri.—**Pierce City:** the temperature at 7 a. m. of the 5th was -22° ; at 2 p. m., -4° ; 9 p. m., -9° ; daily mean, $-11^{\circ}.6$. Mr. J. J. Spilman, voluntary observer, states that that was the coldest day that has occurred since 1847.

Prof. Francis E. Nipher, director of the Missouri Weather Service, reports:

The lowest temperature recorded in Saint Louis was $-23^{\circ}.4$, which is half a degree colder than the previously observed minimum in January, 1873. In the state the temperature has fallen still lower. The lowest minimum reported was -33° at Sedalia; Warrensburg and Kirksville reporting -32° ; Boonville and Harrisonville, -31° ; Miami, -30° , and Savannah, -27° . The highest minimum temperatures reported were -16° at Cairo, Illinois, $-23^{\circ}.5$ at Saint Louis, and $-24^{\circ}.2$ at Keokuk, Iowa.

The following notes on the low temperature of the 5th are given by the observers: Saint Charles, the 5th was the coldest ever observed here; Oregon, coldest since January 18, 1857, when the thermometer registered -30° ; Louisiana, thermometer stood at -33° on the river bridge; Ironton, coldest weather yet observed here, thermometer read -23° , the coldest heretofore was -17° ; Chamois, January, 1875, the thermometer read two degrees lower than in the present month; Clinton, -32° at 7 o'clock; Steelville, on the 5th, -18° . The observer at O'Fallon reports that on January 29, 1873, the thermometer read -29° , and at Trenton, Saint Louis county, on January 1, 1864, his thermometer read -23° .

New York.—**New York City:** the lowest temperature for January, 1884, was 8° on the 7th, which is considerably above the average January minimum. The coldest day in New York City during the last fifty years, was January 8, 1866, when a minimum temperature of -7° occurred. At the Brooklyn navy-yard and on Bedford avenue, Brooklyn, on the same day, temperatures of -12° and -15° , respectively, were recorded. The next coldest days in New York City were January 10, 1875, and December 30, 1880, when the temperature at the signal office was $-6^{\circ}.3$.

Factoryville, Tioga county: temperature on 26th, -21° , is the lowest recorded for several years.

North Carolina.—**Kitty Hawk:** very cold weather prevailed on the 6th, the temperature falling to $8^{\circ}.6$.

New River Inlet: a minimum temperature of 4° occurred on the 6th, which is the lowest observed for many years.

Fort Macon: a minimum temperature of $8^{\circ}.5$ occurred on the morning of the 6th, which is the lowest on the records of the signal office, and is believed to be the lowest recorded during the last twenty years.

Charlotte: on the morning of the 6th a temperature of 5° occurred, which is the lowest observed for many years.

Scott's Hill: the 6th was the coldest day ever experienced; the self-registering thermometer showed a minimum temperature of $4^{\circ}.9$.

Smithville, 6th: the lowest temperature recorded since the opening of the Signal Service station occurred on the morning of the 6th.

Raleigh: a temperature of 2° was recorded on the 5th, which is the lowest, with one exception, that has occurred during the last five years.

Ohio.—**Findlay, Hancock county:** the thermometer read

—20° on the morning of the 5th, which is the lowest observed since 1855, when it read —22°.

Norwalk, Huron county: the night of the 24–25th was one of the coldest ever experienced, the temperature falling to —24°.

Wapakoneta, Auglaize county: at sunrise of the 25th the thermometer read —26°, which is the lowest for many years.

Urbana, Champaign county: during the early morning of the 25th the thermometer registered —28°, which is the lowest ever observed.

Dayton, Montgomery county: the weather on the 25th was the coldest ever known; the temperature at 7 a. m. varied, in different localities, from —14° to —28°.

Toledo: the minimum temperature of the 6th, —14°, is the lowest recorded since 1873. Much suffering resulted from the extremely cold weather of the 5th and 6th. Stock froze to death in localities near this city. Reliable reports state that in some parts of the city thermometers read —17°. Very cold weather also prevailed on the 25th, a minimum temperature of —9° occurring on that date.

Columbus: the lowest temperature (—20°) recorded since the opening of this station in 1878, occurred on the morning of the 6th.

Cincinnati: extremely cold weather prevailed on the 5th. The lowest temperature recorded at the signal office, was —9°.7, but thermometers exposed on the surrounding hills indicated a much lower temperature.

The following record furnished by Mr. G. W. Harper, of Mount Auburn, a suburb of Cincinnati, shows the lowest temperatures that have occurred since 1856:

Year.	Month.	Minimum temperature.	Year.	Month.	Minimum temperature.
1856.....	January.....	—14	1875.....	January.....	—10
1857.....	January.....	—13	1876.....	December.....	—10
1864.....	January 1.....	—5	1879.....	January 3.....	—16
1866.....	February.....	—6	1880.....	November 19.....	—12
1870.....	December.....	—8	1884.....	January 5.....	—20

North Lewisburg, Champaign county: the temperature of the 25th, —23°.5, was the lowest experienced for fifty years.

Westerville, Franklin county: on the 25th the temperature fell to —28°, which is the lowest observed for several years.

Fostoria, Seneca county: the night of the 4–5th was the coldest known for many years; on the morning of the 5th the thermometer read —20°.

Bellefontaine, Logan county: at sunrise of the 5th the temperature was —27°, which is the lowest recorded since January 1, 1864, when it was —28°.

Pennsylvania.—Titusville, Crawford county: the weather on the 25th was the coldest known for many years, the thermometer indicating temperatures from —30° to —33°.

South Carolina.—Columbia, Richland county: at 7 a. m. of the 6th the thermometer read 7°; on December 30, 1880, a temperature of 5° occurred.

Seneca, Oconee county: on the morning of the 6th the thermometer read 4°, which is a remarkably low temperature for this latitude.

Charleston: unusually cold weather prevailed on the 6th, the temperature falling to 13°. In only one other instance, since the establishment of the signal office in 1871, has the temperature been as low, viz: 13°, on December 30, 1880.

Tennessee.—Chattanooga: the minimum temperature of the 6th, —1°, is the lowest recorded since the establishment of this station.

Knoxville: a minimum temperature of —16° occurred on the morning of the 6th, which is 2° lower than the lowest temperature previously recorded at the signal office.

Memphis: the minimum temperature of the 6th, —2°, is 4° lower than that for 1875, and is the lowest recorded since the signal office was established in 1871.

Nashville: the minimum temperature. —10°, on the morn-

ing of the 6th is the lowest on the Signal Service records for this place. On January 3d and 9, 1875, minimum temperatures of —8° were recorded.

Texas.—Fort Concho: on the 5th the temperature fell to 4°, which is the lowest recorded during the present season.

Vermont.—Randolph, Orange county, 31st: the month of January has been characterized by unusually cold weather. The mercury froze on three occasions during the month, which is very unusual for this latitude.

Virginia.—Johnsontown, Northampton county: the temperature on the morning of the 7th fell to 4°, which is the lowest that has been observed during the last fifteen years.

Wisconsin.—La Crosse: the mean temperature of the 4th, —22°.7, is the lowest recorded since the establishment of the signal office. The temperature did not rise above —17°; the lowest was —29°. On the 8th a minimum of —23° occurred.

Milwaukee: the mean temperature of the 4th was —20°.7, which is the lowest daily mean recorded since the establishment of the signal office in 1870. On the morning of the 5th the minimum was —24°.3, which is, with the exception of —25° in 1875, the lowest on the signal office records.

Sussex, Waukesha county: the 4th was the coldest day that has occurred during the last twenty years, the daily mean temperature being —24°.5.

Lancaster, Lancaster county: on the morning of the 5th the temperature fell to —34°. The lowest temperature recorded during the last four years is —41°, in 1883.

FROSTS.

Frosts occurred in the various districts on the following dates:

New England.—2d to 31st.

Middle Atlantic states.—1st to 30th.

South Atlantic states.—2d to 14th, 16th to 23d, 25th to 30th.

Florida peninsula.—3d to 23d, 26th.

Eastern Gulf states.—2d to 7th, 9th, 10th, 12th, 13th, 14th, 20th to 26th.

Western Gulf states.—1st to 9th, 11th, 12th, 13th, 20th, 21st, 22d, 24th, 25th, 26th, 28th, 29th.

Tennessee.—1st to 27th, 30th.

Ohio valley.—1st to 27th, 29th, 31st.

Lower lake region.—1st to 31st.

Upper lake region.—1st to 31st.

Extreme northwest.—1st to 31st.

Upper Mississippi valley.—1st to 31st.

Missouri valley.—1st to 31st.

Northern slope.—1st to 31st.

Middle slope.—1st to 31st.

Southern slope.—5th, 7th, 8th, 12th, 20th, 21st, 24th, 25th, 27th.

Southern plateau.—1st to 25th, 27th, 28th, 30th, 31st.

Middle plateau.—1st to 31st.

Northern plateau.—1st, 9th to 24th, 27th to 31st.

North Pacific coast region.—1st, 2d, 9th to 25th, 27th to 31st.

Middle Pacific coast region.—1st, 2d, 9th to 19th, 21st to 24th, 29th, 31st.

South Pacific coast region.—1st, 2d, 7th, 8th, 9th, 12th, 13th, 16th to 19th, 22d, 23d.

Frost was also reported at Brownsville, Texas, on the 3d and 21st.

The following are reports of damage to vegetation in the Southern states by the frosts and cold weather of January:

Limona, Hillsborough county, Florida.—The frost of the 4th damaged pine-apples, oranges, and other vegetation; and the severe weather of the succeeding days killed many tender plants.

Sanford, Orange county, Florida.—Much damage was done to the orange and lemon trees and to vegetables by the cold weather of the 6th.

Mobile, Alabama.—The orange trees and garden vegetables were badly damaged by the cold weather of the 6th. The losses resulting in the surrounding country are estimated at \$500,000.

Jacksonville, Florida, 7th.—Reports from points along the coast, as far south as Manatee, state that the recent cold weather caused serious injury to the orange groves, pine-apples, and garden vegetables.

Dallas, Dallas county, Texas, 11th.—Farmers from the surrounding country report that the oat crop was badly injured by the late cold weather.

Forsyth, Monroe county, Georgia.—The cold weather of the month proved disastrous to vegetation. The oat crop in this state is considered to have been almost totally ruined.

Liberty Hill, Bienville parish, Louisiana, 31st.—The autumn-sown oats were destroyed by the cold weather of January.

Montgomery, Alabama, 31st.—The market gardeners in this vicinity sustained heavy losses by the cold weather of the month.

The following extract is taken from the Montgomery "Advertiser and Mail," of January 30, 1884:

The Commissioner of Agriculture of Georgia has reports from a number of counties in that state, and makes the following estimate of the damage to wheat and oats by the late cold weather: Middle Georgia—damage to wheat, 22.7 per cent.; to oats, 53.75 per cent. Southwest Georgia—damage to wheat, 4.25 per cent.; to oats, 63.75 per cent. North Georgia—damage to wheat, 15.9 per cent.; to oats, 58.45 per cent. East Georgia—damage to wheat, 41 per cent.; to oats, 64.75 per cent. State at large—damage to wheat, 30 per cent.; damage to oats, 60 per cent.

ICE.

Under the heading "ice in rivers and harbors" the subject of ice formation in the northern sections of the country is considered. In the Southern states the following instances of ice formation have been reported:

Alabama.—Anburn, 2d, 3d, 7th, 8th, 9th, 20th, 21st, 26th; Mobile, 2d, 3d, 4th, 6th 9th.

Arizona.—Fort Grant, 1st, 2d, 3d, 11th, 12th, 18th, 19th, 20th, 24th; Wickenburg, 1st to 4th, 12th, 14th, 24th; Yuma, 1st, 2d.

Florida.—Saint Augustine, 3d, 4th, 6th, 9th, 10th, 21st, 22d; Archer, 3d, 4th, 6th, 7th, 9th, 23d; Limona, 4th, 6th, 21st, 22d; Newport, 5th; Jacksonville, 3d, 4th, 6th, 21st, 22d, 23d; Sanford, 6th, 21st, 22d; Cedar Keys, 3d, 22d; Pensacola, 3d, 4th, 6th, 9th, 24th, 25th.

Georgia.—Andersonville, 8th.

Louisiana.—New Orleans, 3d, 5th, 6th, 8th, 21st; Grand Coteau, 9th.

North Carolina.—Brevard: the creeks froze over on the 6th; New River Inlet, 3d, 6th, 7th; Fort Macon, 6th.

Texas.—Galveston, 1st, 2d, 5th, 6th, 24th; Indianola, 1st, 2d, 5th, 6th, 20th, 21st; Brownsville, 3d, 6th.

PRECIPITATION.

[Expressed in inches and hundredths.]

The distribution of rainfall over the United States and Canada for January, 1884, as determined from the reports from more than six hundred stations, is exhibited on chart iv.

Table of rainy and cloudy days, relative humidity, and dew-point for Jan., 1884.

Districts.	† Rainy days.	‡ Cloudy days.	Rel. humidity. *	Dew-point.
			Percentages.	
			From 73.3 to 80.2	From 11.0 to 24.2
New England.....	From 13 to 17	From 7 to 16	61.2 " 83.0	11.9 " 29.8
Middle Atlantic states.....	" 12 " 20	" 8 " 15	66.9 " 80.2	29.2 " 44.2
South Atlantic states.....	" 11 " 20	" 8 " 15	66.9 " 80.2	29.2 " 44.2
Florida peninsula.....	" 8 " 13	" 5 " 9	78.2 " 83.3	46.5 " 61.3
East Gulf states.....	" 11 " 18	" 7 " 14	70.6 " 73.6	31.8 " 37.7
West Gulf states.....	" 9 " 14	" 5 " 10	67.3 " 78.4	21.0 " 40.3
Rio Grande valley.....	" 3 " 5	" Five	61.7 " 73.4	37.2 " 43.5
Ohio valley.....	" 12 " 24	" 9 " 17	67.2 " 81.2	12.2 " 21.0
Tennessee.....	" 16 " 22	" 12 " 18	70.3 " 80.3	23.6 " 26.4
Lower lake region.....	" 17 " 29	" 14 " 25	65.6 " 84.2	11.4 " 16.1
Upper lake region.....	" 13 " 27	" 5 " 25	63.3 " 79.8	0.1 " 15.1
Extreme northwest.....	" 7 " 16	" 3 " 8	85.7 " 89.8	-10.6 " 3.2
Upper Mississippi valley.....	" 10 " 17	" 5 " 12	56.1 " 88.6	0.9 " 21.2
Missouri valley.....	" 9 " 17	" 3 " 6	69.6 " 75.9	1.5 " 12.4
Northern slope.....	" 6 " 16	" 2 " 13	51.5 " 89.1	-0.4 " 14.4
Middle slope.....	" 4 " 8	" 1 " 4	54.4 " 69.9	12.1 " 18.3
Southern slope.....	" 5 " 8	" 2 " 8	58.0 " 73.7	23.2 " 28.4
Southern plateau.....	" 2 " 11	" 2 " 5	52.2 " 65.9	22.4 " 27.3
Northern plateau.....	" 7 " 16	" 5 " 8	69.8 " 82.7	19.3 " 25.0
North Pacific coast.....	" 11 " 16	" 12 " 13	77.4 " 81.9	31.8 " 37.1
Middle Pacific coast.....	" 9 " 13	" 7 " 14	73.3 " 82.3	36.5 " 44.5
South Pacific coast.....	" 3 " 8	" 5 " 6	40.6 " 62.9	27.5 " 40.4
Mt. Washington, N. H.....	Twenty	Five	80.9	2.2
Pike's Peak, Colo.....	Eight	None	77.6	-3.5
Salt Lake City, Utah.....	Nine	Seven	54.6	14.7

* Relative humidity corrected for altitude. † Including all days on which rain or snow fell. ‡ Including all cloudy days—with or without snow.

In the first column of the following table is shown the average precipitation for January in each of the various districts for several years, as determined from observations made at the Signal Service stations; in the second column are given the averages for January, 1884, and the third column shows the excess or deficiency of January, 1884, as compared with the average:

Average precipitation for January, 1884.

Districts.	Average for January. Signal-Service observa- tions.		Comparison of Jan., 1884, with the average for several years.
	For several years.	For 1884.	
	Inches.	Inches	Inches.
New England.....	3.71	5.51	1.80 excess.
Middle Atlantic states.....	3.78	5.83	2.05 excess.
South Atlantic states.....	4.70	5.48	0.78 excess.
Florida peninsula.....	3.34	3.39	0.55 excess.
Eastern Gulf states.....	5.55	5.65	0.10 excess.
Western Gulf states.....	4.00	3.75	0.25 deficiency.
Rio Grande valley.....	1.15	0.78	0.37 deficiency.
Tennessee.....	5.38	6.34	0.96 excess.
Ohio valley.....	3.58	2.98	0.60 deficiency.
Lower lake region.....	2.51	3.39	0.88 excess.
Upper lake region.....	1.79	2.05	0.26 excess.
Extreme northwest.....	0.62	0.37	0.25 deficiency.
Upper Mississippi valley.....	1.86	1.01	0.85 deficiency.
Missouri valley.....	0.74	0.56	0.18 deficiency.
Northern slope.....	0.90	1.24	0.34 excess.
Middle slope.....	0.39	0.30	0.09 deficiency.
Southern slope.....	0.55	0.65	0.10 excess.
Southern plateau.....	0.62	0.42	0.20 deficiency.
Northern plateau.....	3.26	2.64	0.62 deficiency.
North Pacific coast.....	7.13	3.68	3.45 deficiency.
Middle Pacific coast.....	5.22	3.64	1.58 deficiency.
South Pacific coast.....	2.24	1.50	0.74 deficiency.
Mount Washington, N. H.....	4.28	2.45	1.83 deficiency.
Pike's Peak, Colo.....	1.76	0.10	1.66 deficiency.
Salt Lake City, Utah.....	1.36	0.71	0.65 deficiency.

From the above table it will be seen that the precipitation has been excessive in the districts on the Atlantic coast, in the lake region, northern and southern slopes, and in Tennessee. The greatest excess over the average precipitation occurred in New England and the middle Atlantic states, where the departures were 1.80 and 2.05, respectively. In the eastern Gulf states, lake region and northern and southern slopes the departures range from 0.10 to 0.88. In the districts west of the Rocky mountains, extreme northwest, western Gulf states, and Ohio, Missouri, upper Mississippi and Rio Grande valleys, the precipitation for the month has been below the average. The deficiencies in said districts were generally small, except on the Pacific coast where but little over half of the usual amount of rain fell. On the summits of Mount Washington, New Hampshire, and Pike's Peak, Colorado, the deficiencies in the monthly precipitation were 1.83 and 1.66, respectively.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The departures exhibited by the reports from the regular Signal Service stations, are shown in the table of average precipitation for January, 1884. Voluntary observers report the following notes in connection with this subject:

Arkansas.—Lead Hill, Boone county: monthly precipitation, 2.05, is 0.89 below the January average of the two preceding years.

Illinois.—Anna, Union county: monthly precipitation, 2.01, is 1.86 below the January average of the last nine years.

Riley, McHenry county: monthly precipitation, 0.80, is 1.04 below the January average of twenty-three years. In only three years during that period has the January precipitation been less, viz.: in 1865, '66, and '72.

Mattoon, Coles county: monthly precipitation, 0.90, is 1.60 below the January average of the last five years.

Indiana.—Wabash, Wabash county: monthly precipitation, 1.29, is 0.48 below the January average of the last eight years.

Logansport, Cass county: monthly precipitation, 1.80, is 0.27 below the January average of twenty-five years. The monthly snow-fall, 16.22, is 4.67 above the average of the same period.

Kansas.—Independence, Montgomery county: monthly precipitation, 0.68, is 0.87 below the January average of the last twelve years.